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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,903	01/15/2002	Colin Ramshaw	A01206US	7372

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GARVEY SMITH NEHRBASS & DOODY, LLC
THREE LAKEWAY CENTER
3838 NORTH CAUSEWAY BLVD., SUITE 3290
METAIRIE, LA 70002

EXAMINER	
BHAT, NINA NMN	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/913,903	RAMSHAW ET AL.	
	Examiner	Art Unit	
	N. Bhat	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 January 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The examiner acknowledges applicant's attempts in correcting the inventorship however, applicant is suggested to carefully review 37 CFR 1.48(a) as well as provide a new oath.

As it appears that a party required by 37 CFR 1.48(a)(2) to submit a statement of facts may not be willing to submit such statement, applicant should consider either: a) submission of a petition under 37 CFR 1.183 to waive that requirement if the original named inventor(s) has assigned the entire right and interest to an assignee who has given its consent to the requested inventorship correction, MPEP § 201.03, Statement of Lack of Deceptive Intention, or b) refiling the application (where addition is needed under 37 CFR 1.53(b) with a new oath or declaration and any necessary petition under 37 CFR 1.47, or where only deletion is needed, either under 37 CFR 1.53(b) utilizing a copy of a prior oath or declaration under 37 CFR 1.63(d)(1)(iv), or under 37 CFR 1.53(d))(design applications only), thereby eliminating the need for a 37 CFR 1.48 request.

An oath or declaration by each actual inventor or inventors listing the entire inventive entity has not been submitted.

The statement of facts by the inventor(s) to be added does not explicitly state that the amendment of the inventorship is necessitated by amendment of the claims and that the inventorship error occurred without deceptive intent on the part of the inventor(s) to be added, or cannot be construed to so state.

1. The disclosure is objected to because of the following informalities: Applicant is required to include on page 14, line 3 the heading "Brief Description of the Drawings". Appropriate correction is required.

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show element 18 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "18" and "20, 25" have both been used to designate the shear member. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Porter et al. USP 4,549,998 in combination with GB 2 108 407 and Cowen et al. USP 4,356,133

Porter et al. teach a reactor apparatus or centrifugal device for contacting a liquid with a gas or with a second liquid by carrying out the gas-liquid contact or liquid-liquid contact on a rotating plate whose surface is capable of creating perturbations in the liquid flowing across it to provide intimate mixing or shear mixing to promote reaction. Specifically, if one or more plates are mounted transversely to the axis the use of one or pore plates which is or are capable of creating perturbations in the film of liquid flow there over gives an improvement in mass transfer between the first liquid and second liquid or gas. The plate surface is capable of creating perturbations in the liquid flow

across it and the plate can include protrusion from the surface, maybe corrugated, porous or perforated or include indentations. The plate is specifically designed to create perturbations while the liquid film flows along the spinning plate. The plate can also be a foraminate, crib form or can be gauze or mesh like and are disposed symmetrically about the axis of rotation of the rotor. The plates can be made of metal or plastic and can be made for a woven, knitted or non-woven fabric. [Note Column 1, lines 15-67 and Column 2, lines 9-50]

However, Porter et al. does not specifically recite that the plate includes a shear member close to the rotating surface of the thin film member.

GB 2180407 teach a reactor for the continuous production of epoxide resins by the conversion of liquid starting constituents such as epichlorohydrin, phenols or halogenated phenols in the reactor being pressure resistant and having a circular stator (1) and a circular driven rotor (2) having mutually facing surfaces each with intermeshing tooth elements (3) arranged inc concentric tooth circles surround the stator having inlets (5,6) and an outlet (7). The toothed structure provides shear mixing and adequate reaction residence time for the reaction to take place while spinning disc technology is employed. [Note Page 1 lines 50-100]Specifically GB 2180407, teach an epoxide polymerization reaction which employs spinning disc technology which includes a reactor apparatus including a support element rotatable about its axis, the support element having a surface with a periphery and feed mechanism to supply reactant to the surface the reaction flows across the surface as a thin film. GB 2180407 teaches that in carrying out the epoxide resin reaction, the reaction mixture flows under pressure

through the inlet (5) between the first and second tooth circles of the stator (1) into the reactor and carried along by the rotary movement of the tooth elements (3) of the rotor (4) flung outwards by the centrifugal forces deflected by the tooth elements (3) of the stator and intensively mixed thereby reacting in such a way to completely converted the reactants into epoxides resins.[Note Page 2, lines 48-64]

Cowen et al.'133 teach providing a spinning disc reactor, which includes providing a reactant medium, which is transported across the surface of a body rotating at high speed, discharged therefrom by centrifugal force. A chemical reaction takes place awhile the reactant is spinning and in contact with the spinning disc surface. Cowen et al.'133 teach that the rotating body has a coaxial surface of rotation and my be a solid body, a hollow body or shaped vessel, it can be plate shaped but more preferred is using a cup or blown shape having a flanged rim and /or substantially verticals sides so that the rotation of the body will generate a force which will operate on a liquid supplied to the surface, forces which include a centrifugal force operating radially from the axis of rotation, the rotary force will impart a stirring or shearing action on the liquid reactants.[Note Column 2, lines 32-65] Cowen et al'133 teach that the rotating bowl or cup can include the catalyst or other promoters which can be included to the surface of the bowl or cup assembly.

It would have been obvious from the combined teachings of Porter et al., GB 2180407 and Cowen et al.'133 to provide a reactor apparatus using RSORT or spinning disc technology to provide a thin film reaction using the spinning disc. Although, none of the references specifically teach using a shear member which is close to the rotating

surface, all of the references teach imparting a shear force on the liquid while spinning by including perturbations such as taught in Porter et al., and teeth as taught in GB 2180407 and using a bowl or cup shape rotating body as taught in Cowan et al. the perturbations, teeth and bowl or cup all being functionally equivalent to applicant's shear member, because the prior art teaches that the perturbations, teeth and bowl/cup rotary members are specifically designed to provide a shear force or intimately mix the reactants while the reactants are spinning or subjected to centrifugal force. With respect to where the shear member is place in relation to the surface of the spinning disc, this concept would have been obvious to one having ordinary skill in the art because, the art teaches and recognizes that providing perturbations, or teeth or a specific bowl or cup shape would provide intimate mixing or create a shear force during the centrifugal force taking place on the reactants, and to provide the optimized spacing and location of where the shear member would be place in relation to the spinning disc would have been obvious to one having ordinary skill in the art because the art has taught and recognizes that placing baffles, perturbations etc will cause shear forces and initiate mixing and would improve the overall efficiency of the reactor from heat, mass, momentum and reaction kinetics point of view and to optimize the position which provides best results and improves overall efficiency of the reactor would have been obvious to one having ordinary skill in the art at the time the invention was made. In Cowen et al.'133 element (9) could be construed as being a shear member even though Cowen's element (9) is an opaque shield but there is no preclusion that the shield could equivalently and concomitantly function as a shear member, it maintained that without

applicant specifically teaching and showing that the shear member would provide improved and unexpected results over the teeth of GB 2180407, the perturbations of Porter et al. and cup/bowl rotary member of Cowen and/or element (9) of Cowen, applicant's invention as a whole is obvious because to provide intimate mixing or shear mixing or mixing of any type would improve heat, mass and momentum transfer within the reactor and to add a shear member, or any type of baffle, or vane structure to improve heat, mass or momentum transfer, reaction kinetics, etc., is well within the purview of the ordinary artisan.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cowen et al.'570 teach a chemical process on the surface of a rotating body. WO 03/008460 teaches improved polymerization reactions suing RSORT technology. Burns et al. teach a process for making amino esters utilizing a spinning disc reactor. WO 00/48729 teach a RSORT reactor which includes a rotatably disc having trough and in an upper surface thereof. WO 01/60511 teach a rotating surface or revolution reactor with feed and collection mechanisms. Brechtelsbauer et al. teach a process for approximation substituted cyclohexanones using a rotating disc reactor. Nowak et al. teach thin film epoxidation of an unsaturated oil or alkyl fatty acid ester.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

N. Bhat
Primary Examiner
Art Unit 1764